Additional Problems: 1-Variable Equations and Inequalities

**Rearranging Formulas**

1. Which of the following is an example of using the Division Property of Equality to rearrange the equation AB = xCD?
	1. C = AB – xD
	2. D = ABxC
	3. X = $\frac{AB}{CD}$
	4. C = $\frac{xD}{AB}$
2. Consider the formula that relates distance, velocity, and time (d = vt). If you are interested in the time it takes for a snail traveling at a speed of 2 centimeters per second to crawl up a 1-meter section of a wall, which unit conversion makes the most sense to use?
	1. Converting meters to centimeters by dividing 1 meter by 100 centimeters.
	2. Converting meters to centimeters by multiplying 1 meter by 100.
	3. Converting meters to centimeters by multiplying 1 meter by $\frac{1 meter}{100 centimeters}$
	4. Converting meters to centimeters by multiplying 1 meter by $\frac{100 centimeters}{1 meter}$
3. Consider the formula that relates distance, velocity, and time (d = vt). If you are interested in the time it takes for a mouse traveling at a speed of 5 feet per minute to run across a 30-yard field, which unit conversion makes the most sense to use?
	1. Converting yards to feet by dividing 30 yards by 3 feet.
	2. Converting yards to feet by multiplying 30 yards by 3.
	3. Converting yards to feet by multiplying 30 yards by $\frac{1 yard}{3 feet}$
	4. Converting yards to feet by multiplying 30 yards by $\frac{3 feet}{1 yard}$
4. Using the Property of Equality, what first step would you take to rearrange the formula A = P + Prt using r as the quantity of interest?
	1. Subtract P from both sides of the equation.
	2. Divide both sides by t.
	3. Subtract Pr from both sides.
	4. Divide both sides by P.
5. Rearrange the formula X = mb using m as the quantity of interest.
6. Rearrange the formula A = 3 + xy using x as the quantity of interest.
7. A group of marine biologists collected data on the velocity of a dolphin using a GPS tracker. The GPS tracker measured that the dolphin was swimming at 25 knots. The biologists are interested in finding out how many hours it would take for the dolphin to swim 45 nautical miles if it continues to swim at a constant speed of 25 knots. In order to use units to verify your rearrangement of the formula, what process needs to be done? Enter the value that corresponds to your answer.

Option #1: miles

Option #2: nautical miles

Option #3: hours

I would need to convert the units of distance from knots to Option #\_\_\_\_\_

1. A group of ecologists collected data on the velocity of a river otter using a motion sensor. The motion sensor measured that the river otter was swimming at 3 meters per second. The ecologists are interested in finding out how many seconds it would take for the otter to swim 150 feet if it continues to swim at a constant speed of 3 meters per second. In order to use units to verify your rearrangement of the formula, what process needs to be done? Enter the value that corresponds to your answer.

Option #1: feet

Option #2: seconds

Option #3: meters

I would need to convert the units of distance from meters to Option #\_\_\_\_\_

1. Jason is helping his friend build a rectangular garden. The area of the garden is 36 square meters. The length of the garden is 9 meters. Jason wonders what the width of the garden will be. Jason knows that the formula for the area of a rectangle is (A = *l* \* *w*). How would he rearrange this formula to highlight the width, *w*, as the quantity of interest?
2. Bao is designing a rectangular swimming pool in her backyard. The area of the swimming pool will be 120 square feet. The length of the swimming pool will be 15 feet. Bao wonders what the width of the swimming pool will be. Bao knows that the formula for the area of a rectangle (A = *l* \* *w*). How would she rearrange this formula to highlight the width, *w*, as the quantity of interest? Please also help Bao solve the problem and show your work.